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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/724,403	11/27/2000	Shinji Mackawa	07977/258001/US4448	7575
26171	7590	05/08/2006	EXAMINER	
FISH & RICHARDSON P.C.			SMOOT, STEPHEN W	
P.O. BOX 1022			ART UNIT	PAPER NUMBER
MINNEAPOLIS, MN 55440-1022			2813	

DATE MAILED: 05/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/724,403

Applicant(s)

MAEKAWA, SHINJI

Examiner

Stephen W. Smoot

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-71 is/are pending in the application.
- 4a) Of the above claim(s) 1-60, 62-64 and 67-70 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 61, 65, 66 and 71 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office action is in response to applicant's election filed on 27 December 2005.

#### ***Election/Restrictions***

1. Applicant's election without traverse of species 5, claims 61, 65, 66, 71, in the reply filed on 27 December 2005 is acknowledged.

Claims 1-60, 62-64, 67-70 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected species, there being no allowable generic or linking claim.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. Claims 61, 65, 66, 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakajima et al. (JP 11-31824 A – using US 7,026,197 B2 as an English equivalent translation) in view of Okonogi (US 5,970,366).

Referring to Figs. 1A-2E and column 3, line 52 to column 6, line 49, Nakajima et al. disclose a method of forming a thin film transistor that includes the following features:

- A crystalline silicon film (104) is formed over a glass substrate (101);
- An amorphous silicon film (106) is formed over and in direct contact with the crystalline silicon film (104);
- A heat treatment is performed to getter nickel impurities from the crystalline silicon film (104) into the amorphous silicon film (106);
- The amorphous silicon film (106) with the gettered nickel impurities is subsequently removed by etching;
- A silicon oxide gate insulating film (108) is then formed over the remaining crystalline silicon film (107); and
- An aluminum gate electrode (110) is formed over the silicon oxide gate insulating film (108).

These are limitations set forth in claims 61, 71 of the applicant's invention.

However, Nakajima et al. lack the claim features of a gettering material with a tensile stress of  $8 \times 10^9$  dynes/cm<sup>2</sup> or more (a limitation of claim 61), the gettering material being a silicon nitride film formed by LPCVD (limitations of claim 65), or the silicon nitride having a nitrogen to silicon ratio that ranges from 1.2 to 1.4 (the limitation of claim 66).

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Okonogi teaches that silicon nitride formed by low pressure chemical vapor deposition (i.e. LPCVD) can be used as an alternative to amorphous silicon for extrinsic gettering (see column 3, lines 51-67). Regarding the nitrogen to silicon ratio limitation of claim 66, stoichiometric silicon nitride (i.e.  $\text{Si}_3\text{N}_4$ ) is implied by the disclosure of Okonogi because he does not indicate that the deposited silicon nitride is either rich or deficient in silicon and/or nitrogen content, which would correspond to a ratio of 1.33.

Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to substitute silicon nitride, as taught by Okonogi, for the amorphous silicon film (106) of Nakajima et al. Okonogi recognizes that silicon nitride and amorphous silicon are equivalent materials that can be used for gettering (see column 3, lines 51-67).

Regarding the tensile stress limitation of claim 61, this is a property limitation that is presumed to be inherent to the method of Nakajima et al. and Okonogi, per MPEP section 2112.01, because it is substantially identical to the applicant's as-claimed method. Accordingly, a *prima facie* case of obviousness has been established and the burden shifts to the applicant to show that the products produced by these methods are not the same.

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 61, 65, 66, 71 (see reply filed 14 April 2005) have been considered but are moot in view of the new grounds of rejection.

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**Conclusion**

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen W. Smoot whose telephone number is 571-272-1698. The examiner can normally be reached on M-F (8:00 am to 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SWS

*Stephen W. Smoot*

**STEPHEN W. SMOOT  
PRIMARY EXAMINER**